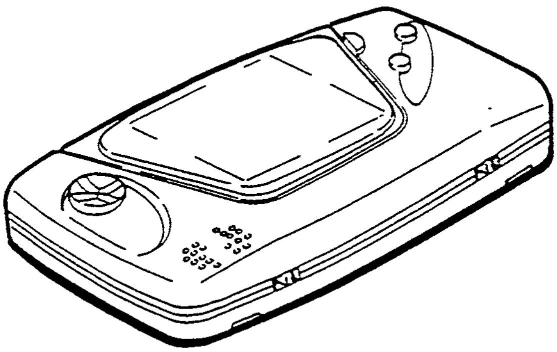
SEGA™ SERVICE MANUAL

GAME GEAR VA1



NO.	004
ISSUED	DECEMBER, 1993

CONTENTS

Sega Enterprises, Ltd.

BEFORE USING THIS SERVICE MANUAL

This service manual covers the one-chip custom LSI (CPU+VDP+SCA).

The First Serial No. of 1 Chip Version Unit.

■ AC 120V area
- 020176537~(For USA)
- 020168498~(For CANADA)
- B20135204~
- K20117921~
- P31000001~

■ AC 230V/240V area
- 020019501~
- B30000001~
- K37000001~
- P31020001~

● COMPARISON WITH ANOTHER MODEL

Electrical Components

COMPONENT	GAME GEAR VA0	GAME GEAR VA1
CPU	IC Z80A	IC CUSTOM CHIP GG
VIDEO PROCESSOR IC	IC CUSTOM CHIP VDP GG	
I/O, LCD CONTROL IC	IC CUSTOM CHIP SCA GG	
MEMORY FOR CPU'S PROGRAM	IC UPD4364G-15L	Same as on left
MEMORY FOR VIDEO PROCESSOR IC	IC HM65256BLFP-12	Same as on left
OP AMP	IC UPC358G2	Same as on left
DUAL SWITCHING REGULATOR	IC MB3775	Same as on left
DUAL LOW-VOLTAGE POWER AMP	IC TDA2822M	Same as on left

1. SPECIFICATIONS

Ratings

Power input	Internal		6 AA (LR6, HP7)Batteries (Longer life alkaline batteries are recommended.)	
	External	AC Adaptor	Input: AC120V 60Hz	Output: DC9V 850mA
			Input: AC230V/240V 50Hz	Output: DC10V 850mA
		Battery Pack	Input: DC9V	Output: DC7.2V 1200mA/h
		Car Adaptor	Uses power from a12V car battery. Input: DC10.57V~16V	Output: DC9V 800mA
Power consumption			9V − 3W(AC120V area), 10V − 3W(AC220V/240V area)	
Operating environment			Temperature: 0℃~40℃, Humidity: 10%RH~80%RH (no condensation)	
Dimensions			210(W) × 113(D) × 39(H) mm	

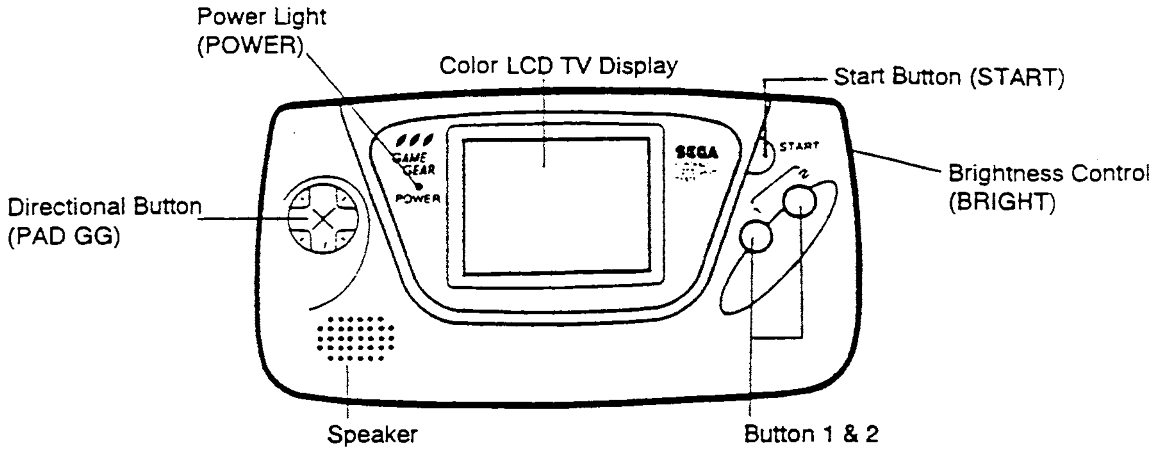
Specifications

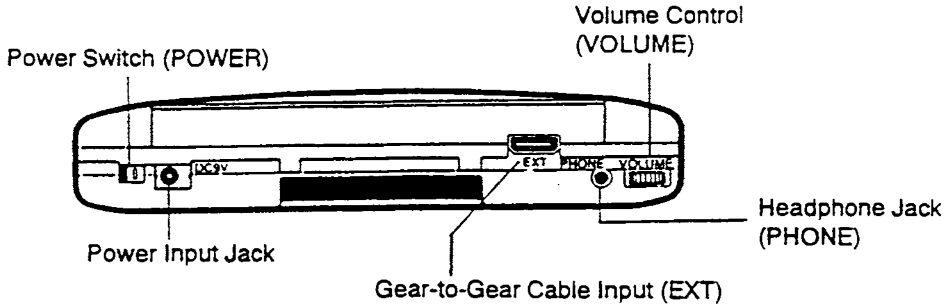
CPU		Z80A (3.58MHz)
Memories	RAM	64kbit
	V-RAM	128kbit
Audio		3 types of sound + 1 noise.
Display capability	VDP	SEGA custom LSI (1 chip= CPU+VDP+SCA)
	Scrolling Screens	160 × 146 dot matrix 32 on-screen colors displayed from a palette of 4096 colors.
	Sprite Screens	64 sprites on-screen with dimensions of 8 × 8 dot or 16 × 16 dot displayed from a palette of 4096 colors.
	Character Patterns	Maximum of 448 defined types possible.
	Scrolling Directions	Horizontal, vertical, diagonal.
	Display	3.2″ Color LCD with Back-Light.
	Screen Dimensions	65.27 mm wide × 48.90mm high
	Screen Composition	160 dot wide × 146 dot high
Headphone terminal		Plug in any set of normal headphones for private play.
Extension terminal		To play multi-player games using more than one Game Gear system.
Slots		For cartridge or TV Tuner Adaptor

∗ Design and specifications are subject to change without notice.

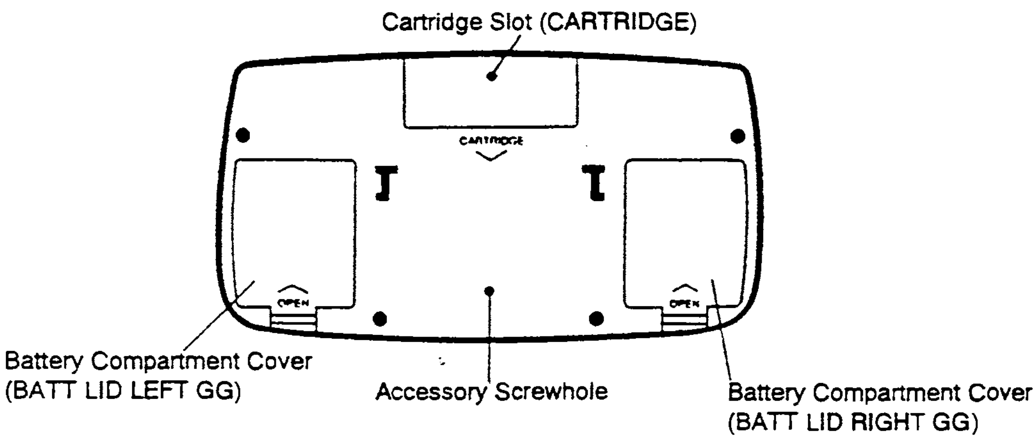
2. IDENTIFYING PARTS

2-1. Front & Top Views of Console





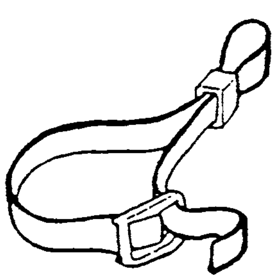
2-2. Bottom View of Console



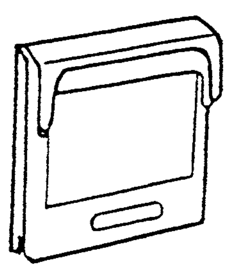
Note: Names of parts in brackets ( ) are used in the parts list.

2-3. Accessories

Strap

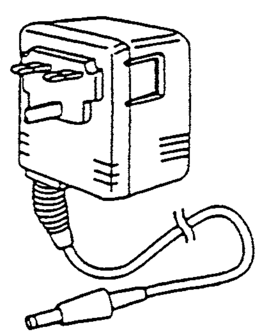


Game Cartridge



(Provided or sold separately)

AC Adaptor



(Kuwait)

3. DISASSEMBLY

3-1. Dismantling Procedure

Removal of bottom screws and bottom case (See Fig.1).

1) Turn the power button off.
2) Turn over the unit.
3) Remove both battery compartment lids (8 & 9).
4) Remove screw (204).
5) Remove six screws (201).

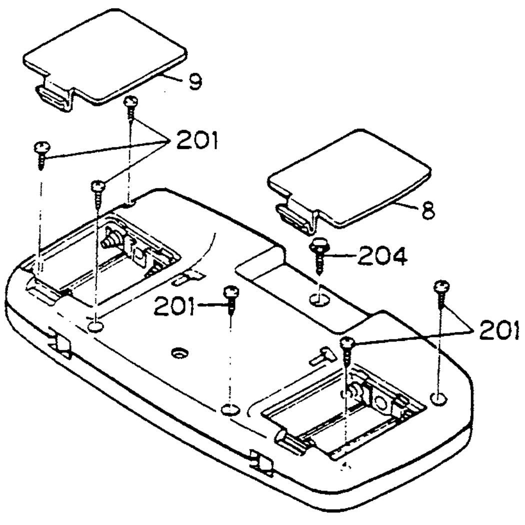


Fig-1

6) Remove the bottom case (See Fig.2).
   Lift bottom case in the direction of arrow (A) and make the open condition.
   Remove the connector of DC-DC converter board fixed on the bottom case.
   Disconnect two connectors of sound board.

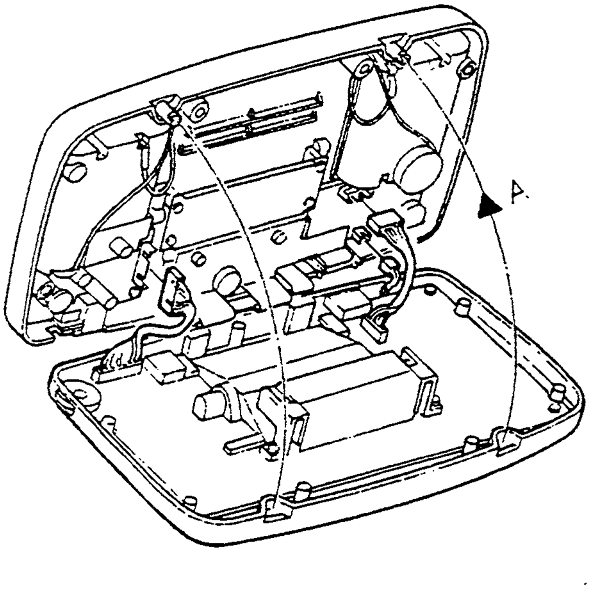


Fig-2

Main board removal (See Fig.3).

1) Remove two screws (202).
2) Remove six screws (203).
3) Remove the main board from the top case.

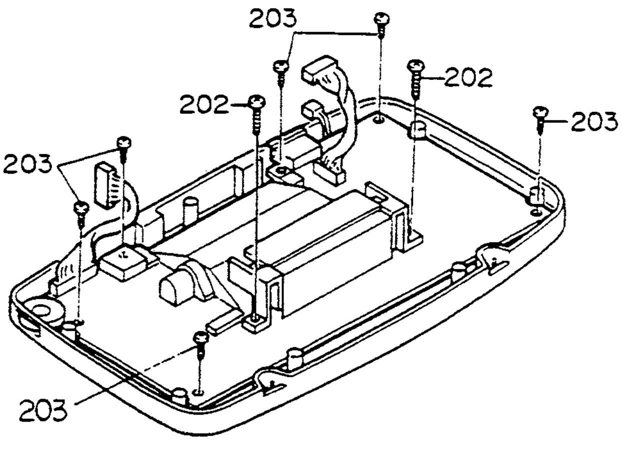


Fig-3

Sound board and DC-DC converter board removal (See Fig.4).

1) Remove four screws (203).
2) Remove the support plate from the bottom case.
3) Remove two screws (203).
4) Remove the sound board from the bottom case.
5) Remove the battery blade cover.
6) Remove two screws (203).
7) Remove the DC-DC converter board.

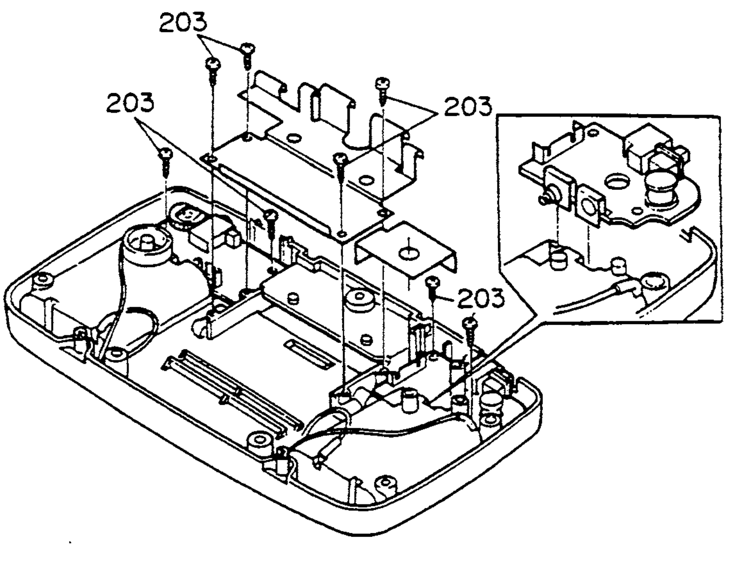


Fig-4

3-2. Reinstalling procedure

Sound board and DC-DC converter board reinstallation.

1) Attach the power knob to the DC-DC converter board.
2) Attach the DC-DC converter board to the bottom case.
3) Tighten two screws (203).
4) Attach the battery blade cover.
5) Attach the sound board.
6) Tighten two screws (203).
7) Attach the support plate.
8) Tighten four screws (203).

Main board reinstallation.

1) Spray surface of inside clear plate with static proof liquid.
2) Carefully check and remove dust inside clear plate and top case using air gun in a clean place.
   Attach each button and rubber contact in its normal position.
3) Attach the LCD cushion along to the bosses in the top case.
4) Lead the speaker cable outside the bosses of the top case.
5) Attach the main board.
   Case 1 After exchange of LCD.
   Take off protective film of LCD.
   Case 2 Others
   Clean surface of LCD using an air gun.
6) Attach the main board inside and along to the bosses of top case.
   Note: When setting the main board, it is important to attach it as quickly as possible to prevent the adhesion of dust on the surface of the LCD and clear plate.
7) Tighten six screws (203).
8) Tighten two screws (202).

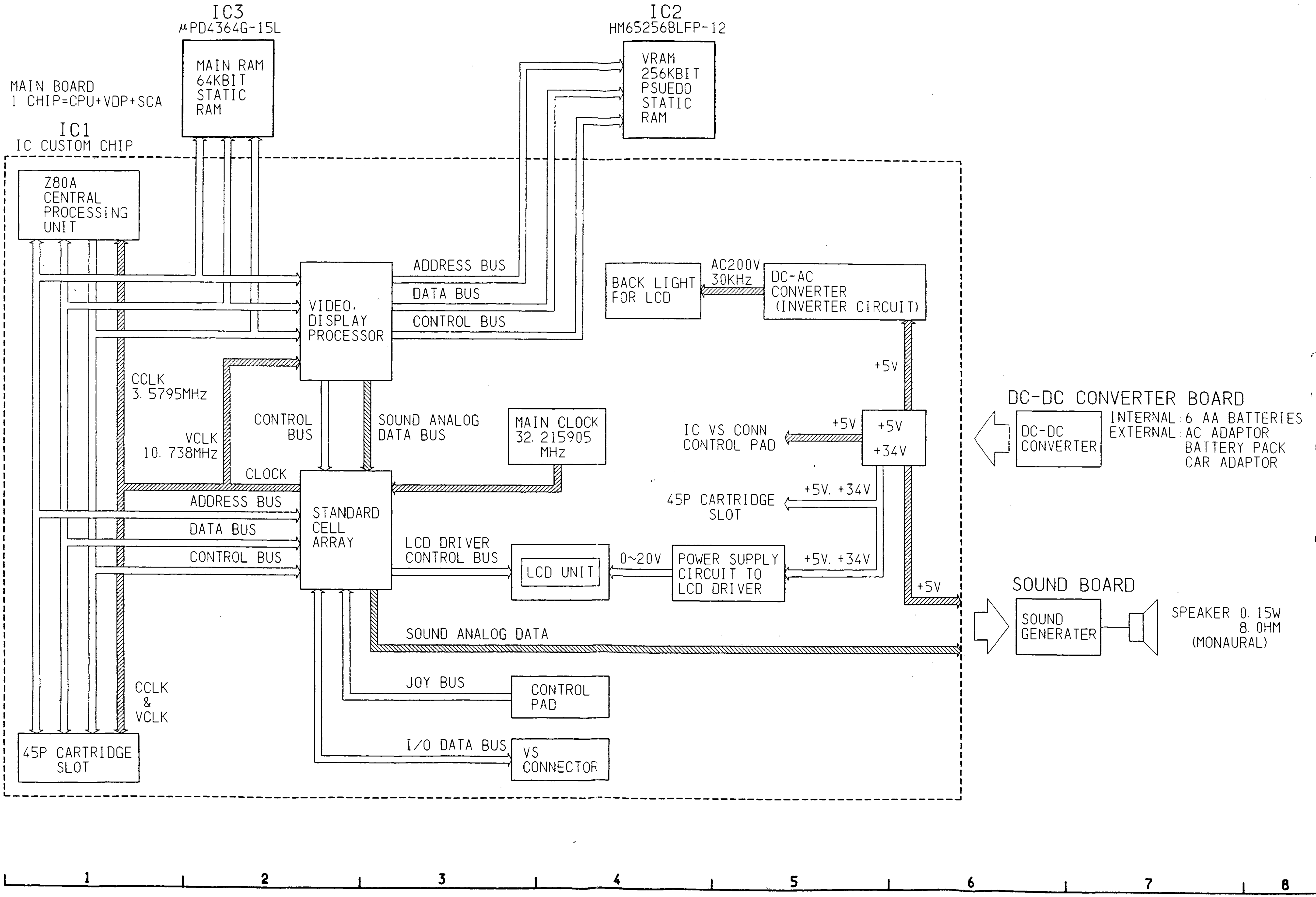
Bottom case reinstallation.

1) Correct 2 connectors from the main board to the sound board and 1 connector from the main board to the DC-DC converter board.
2) Firmly set the bottom case to the top case taking care not to pinch the cables by the edge of the cases.

Tightening the screws on the bottom case.

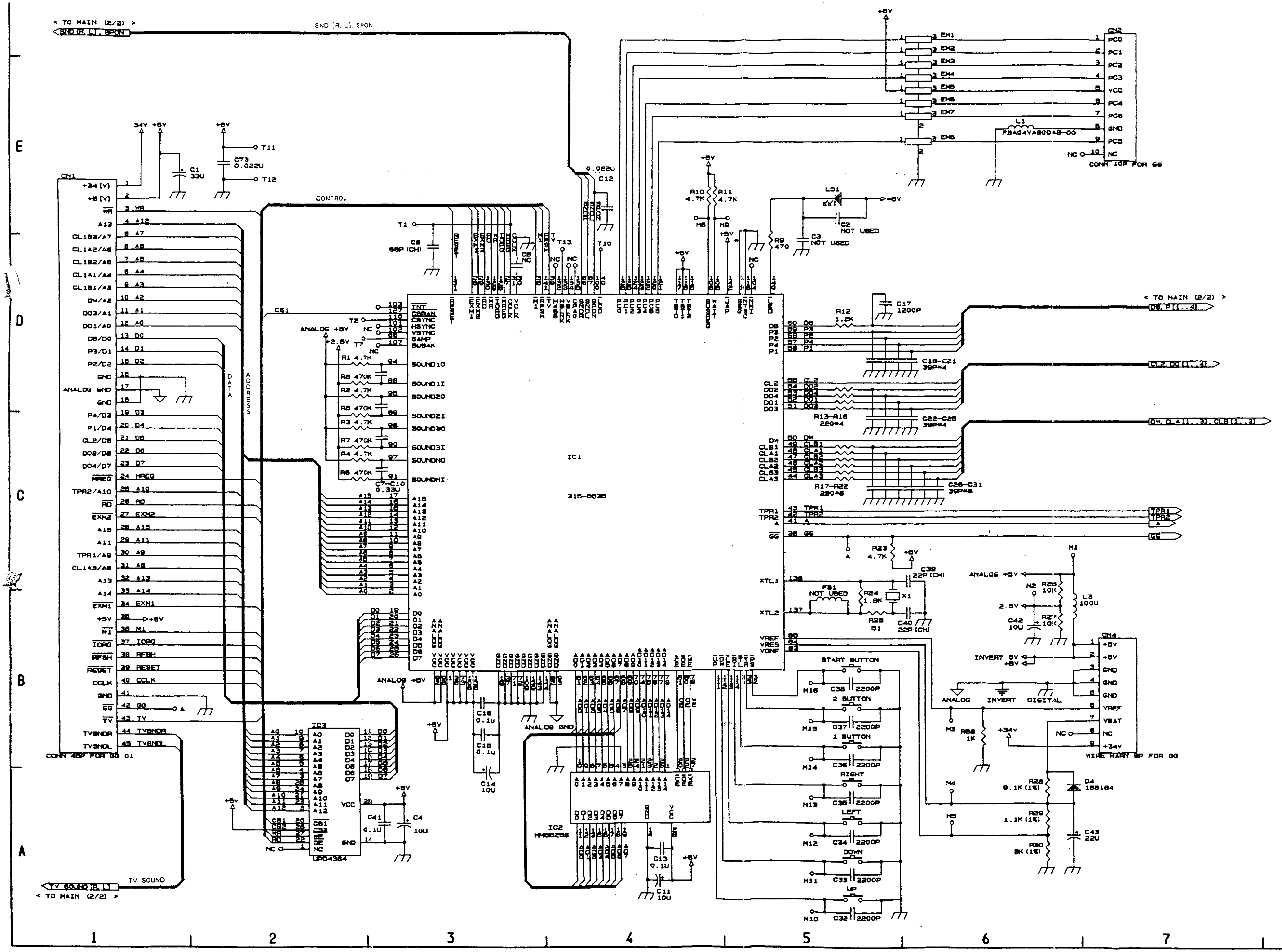
1) Turn over the unit.
2) Tighten six screws (201).
3) Tighten the screw (204).
4) Attach both battery lids (8 & 9).

4. BLOCK DIAGRAM

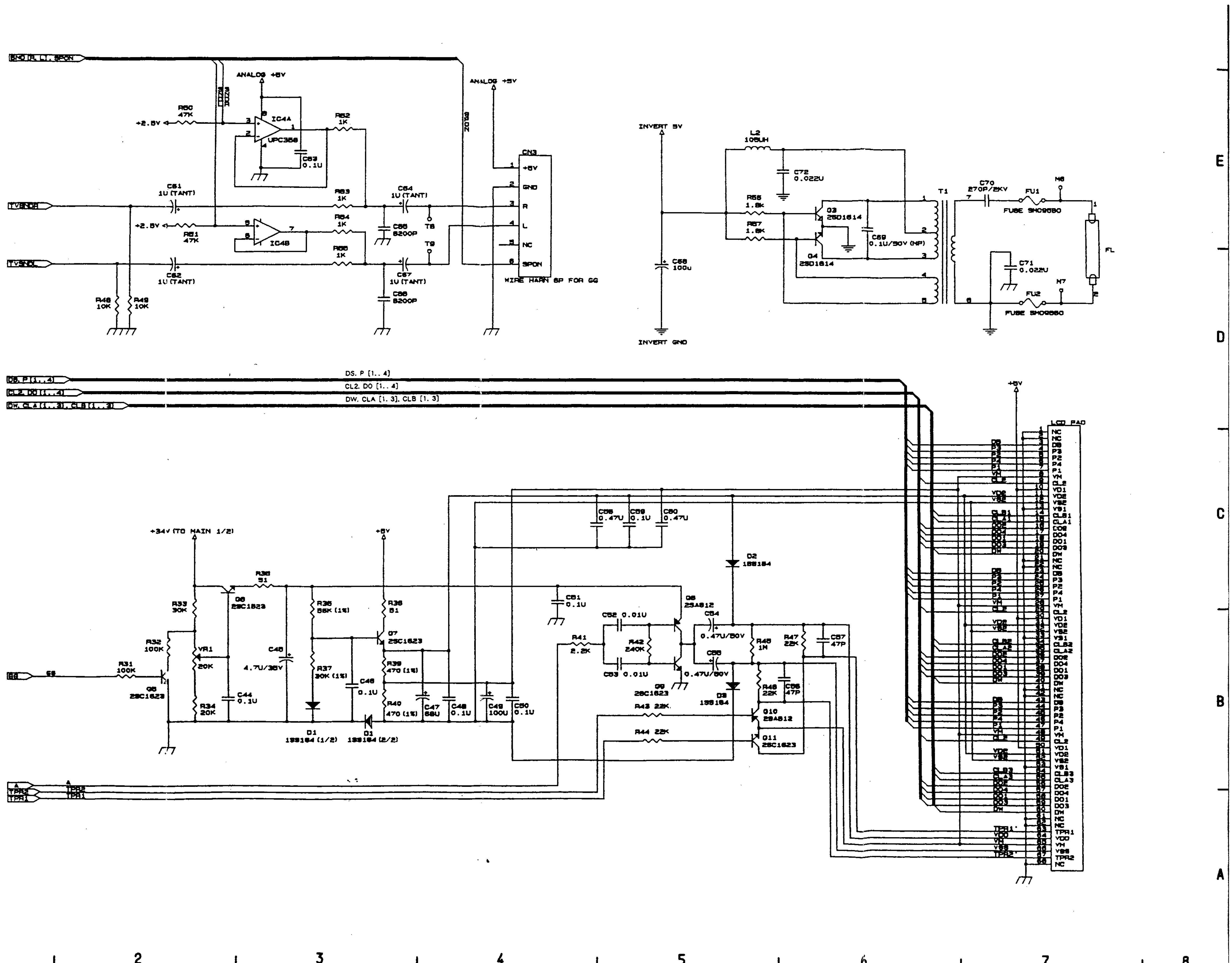


5. SCHEMATIC DIAGRAMS

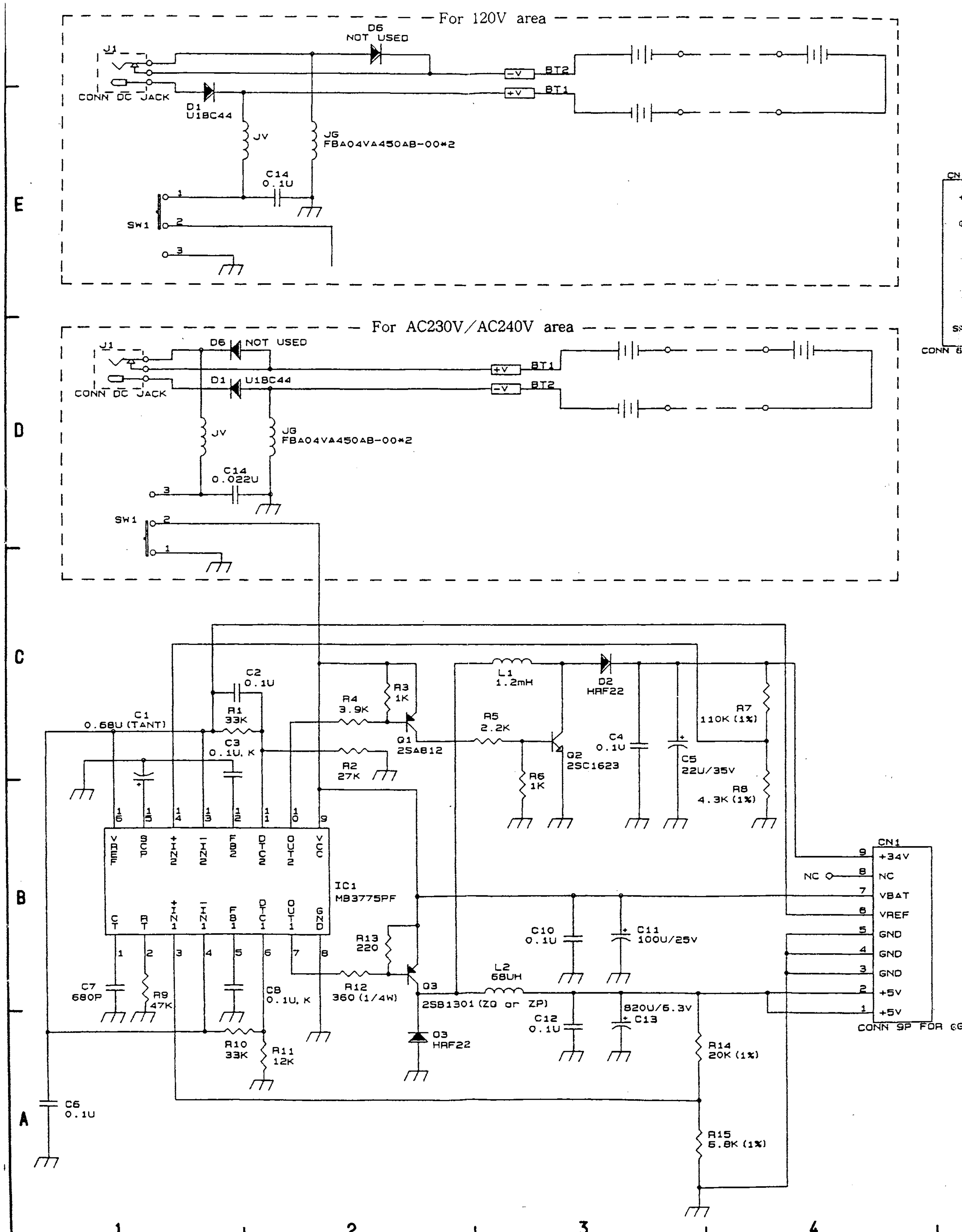
5-1. Main Circuit Board-1



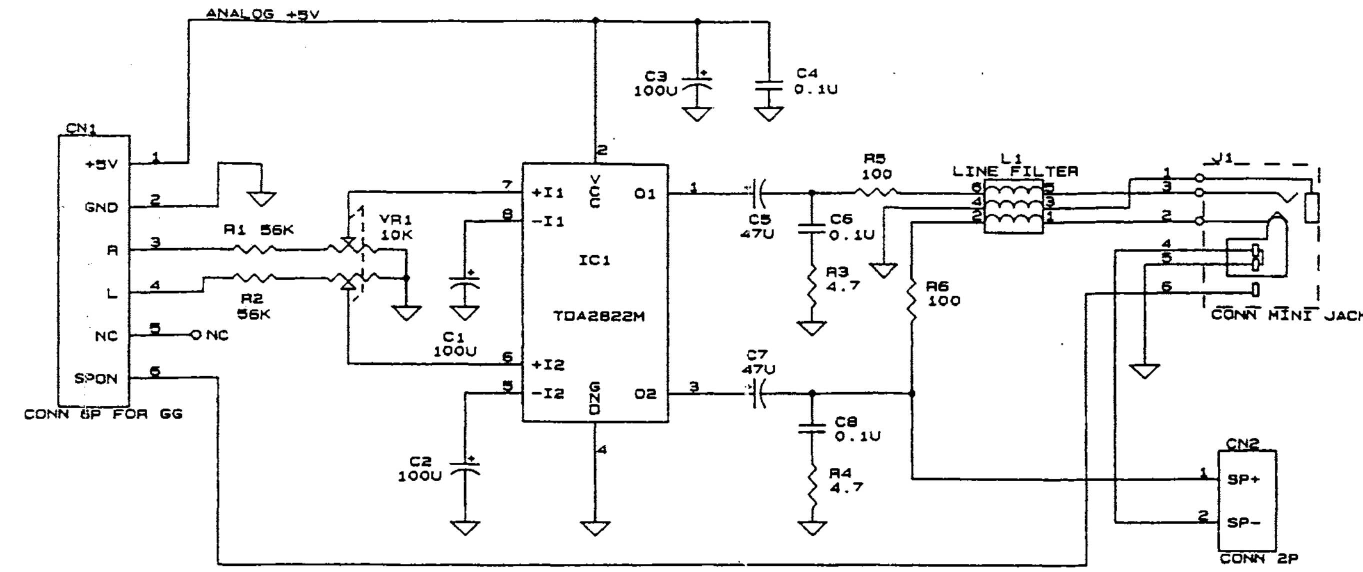
5-2. Main Circuit Board-2



5-3. DC-DC Converter Circuit Board



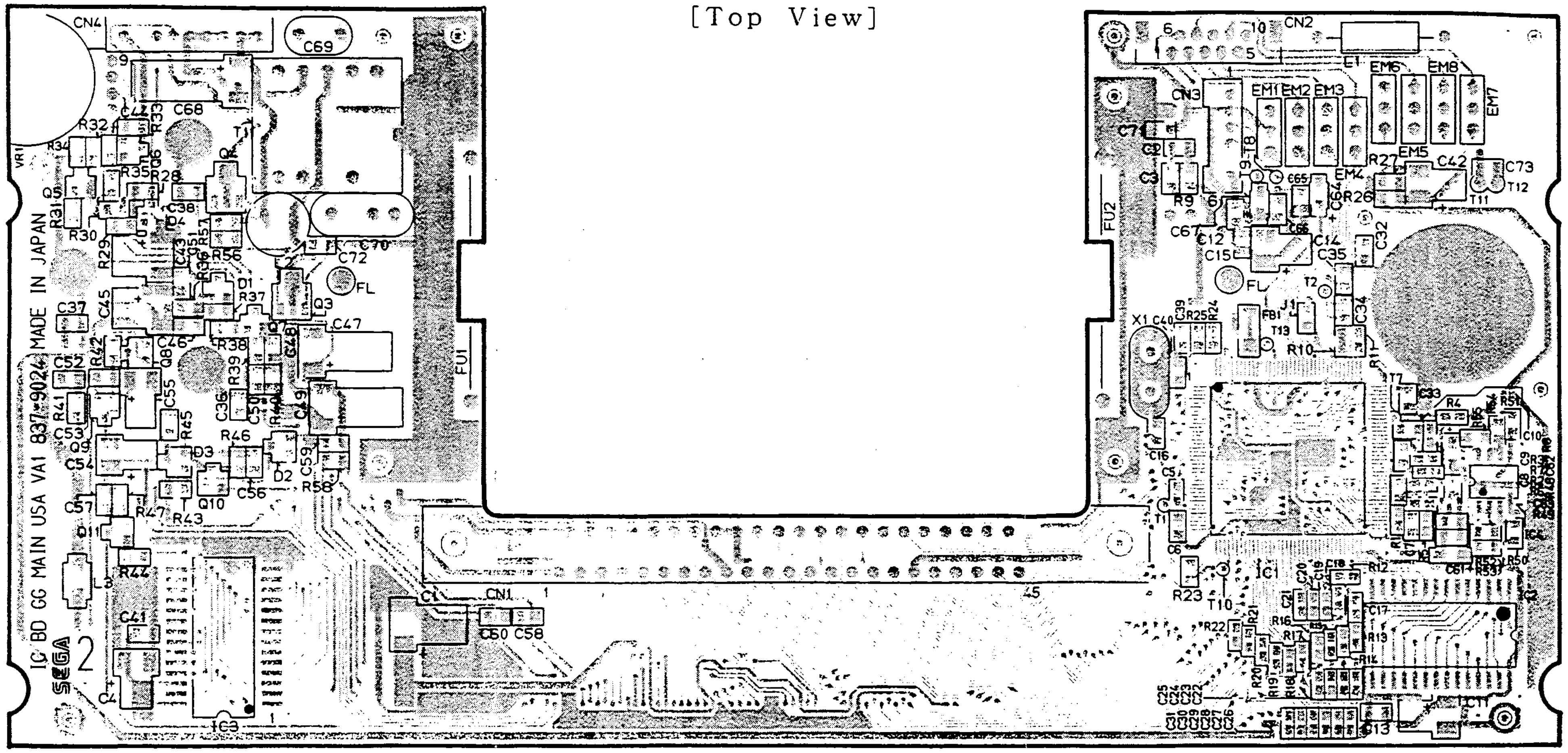
5-4. Sound Circuit Board



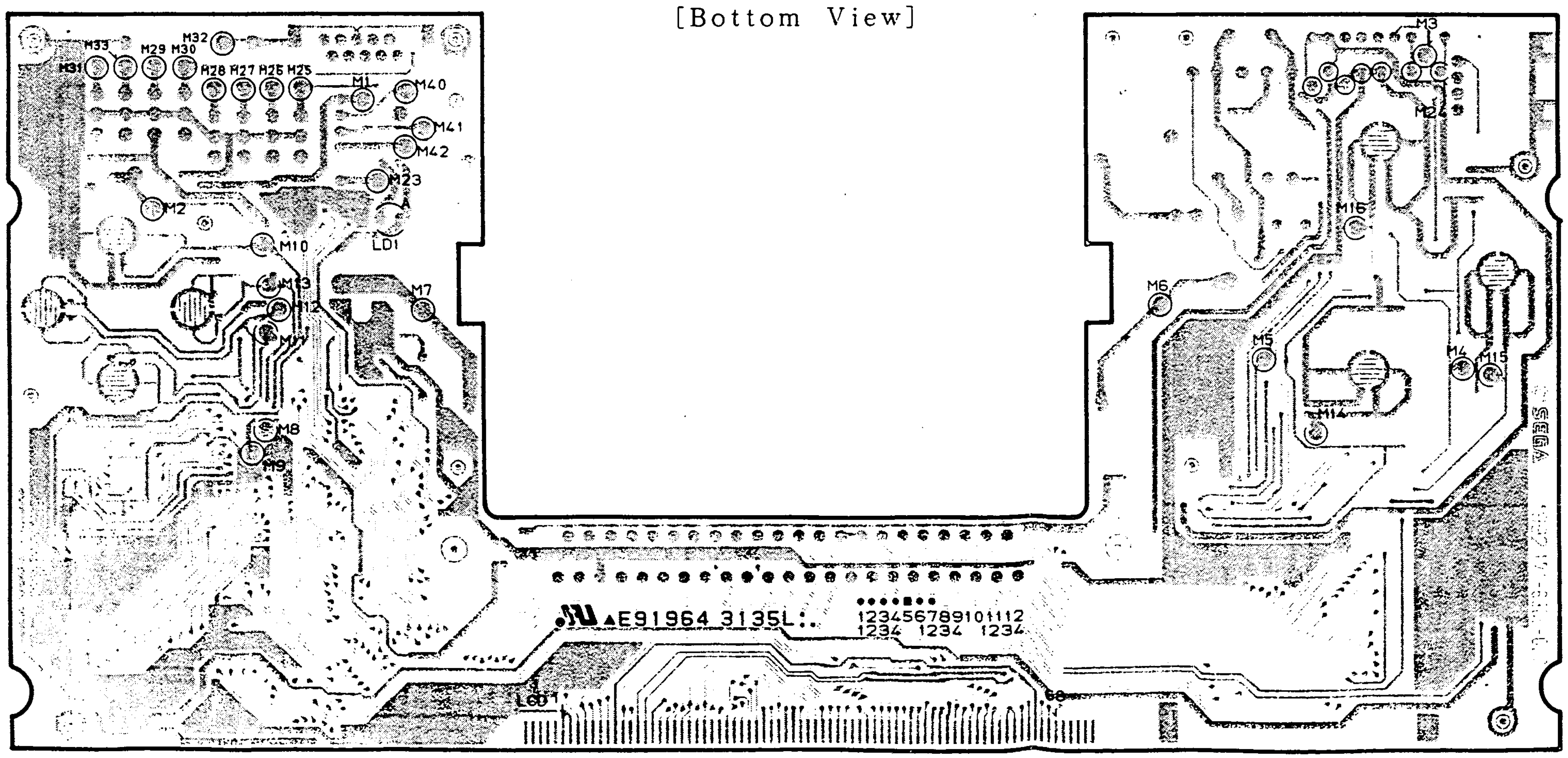
6. CIRCUIT BOARD DIAGRAMS

6-1. Main Circuit Board (AC120V area)

[Top View]

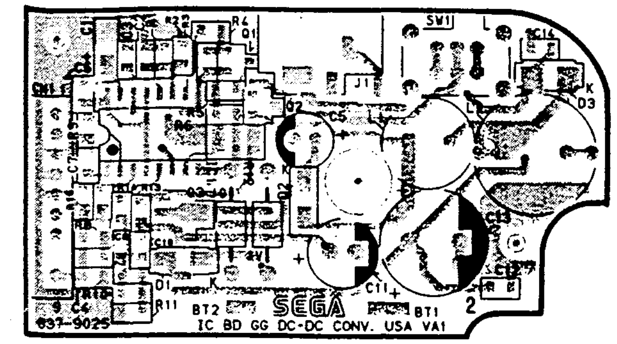


[Bottom View]

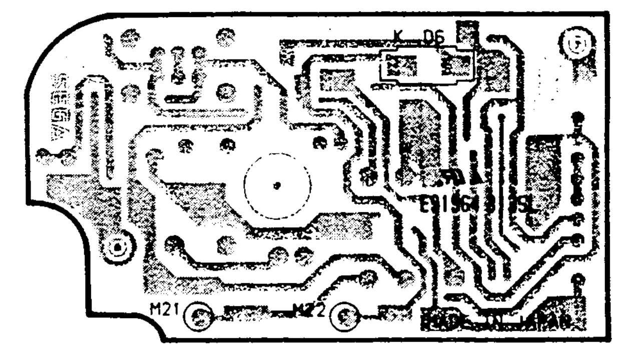


6-2. DC-DC Converter Circuit Board (AC120V area)

[Top View]

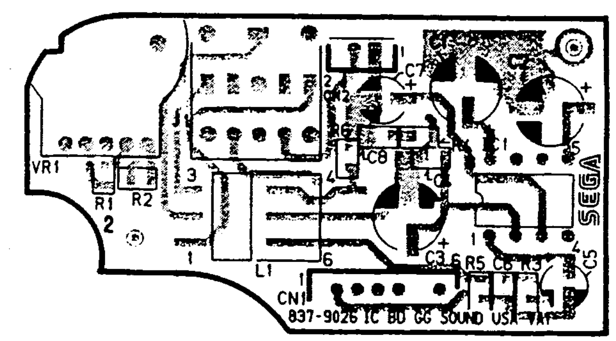


[Bottom View]

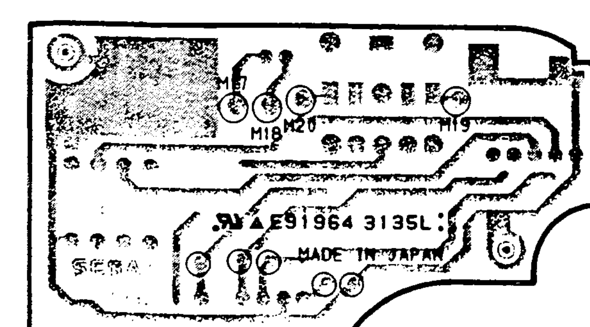


6-3. Sound Circuit Board (AC120V area)

[Top View]

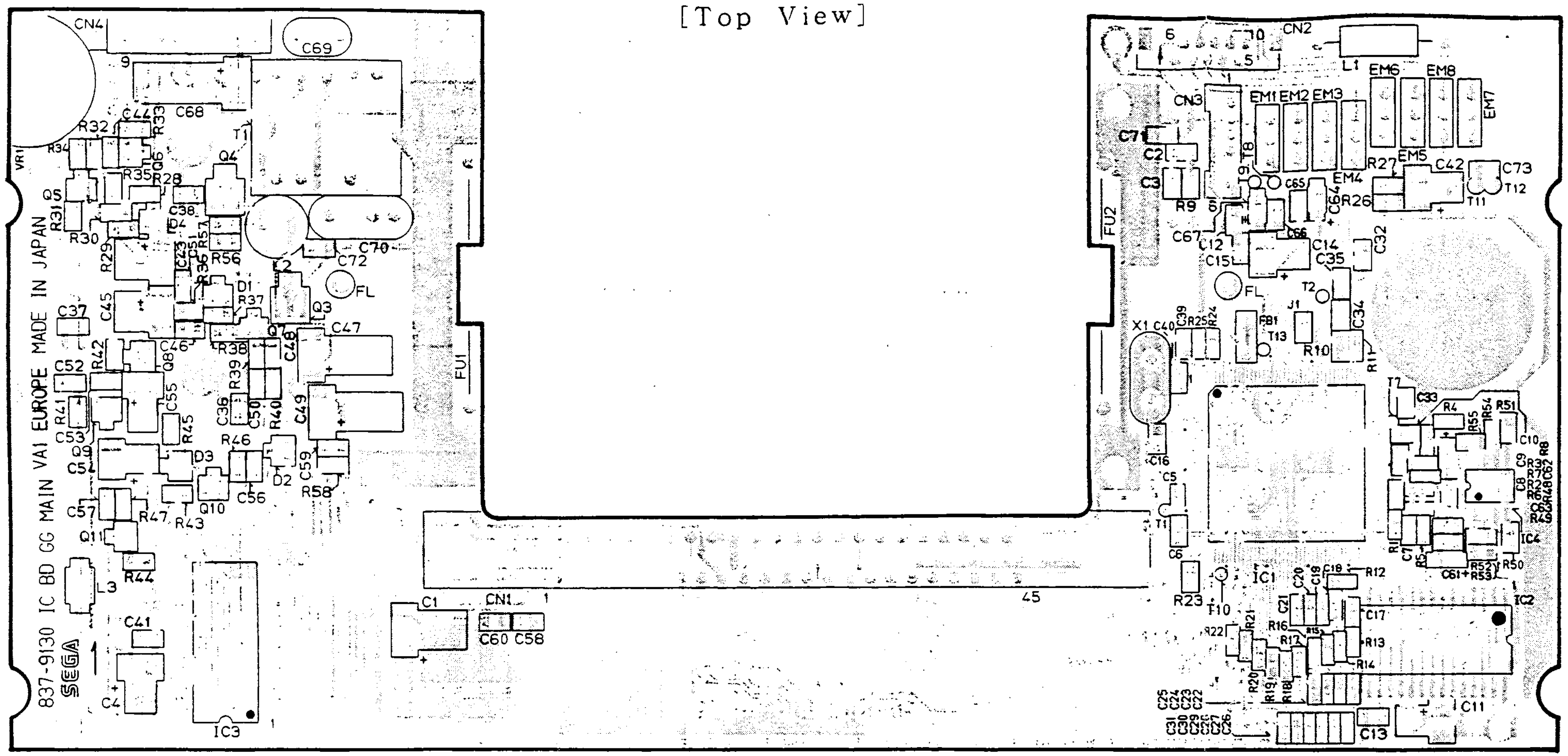


[Bottom View]

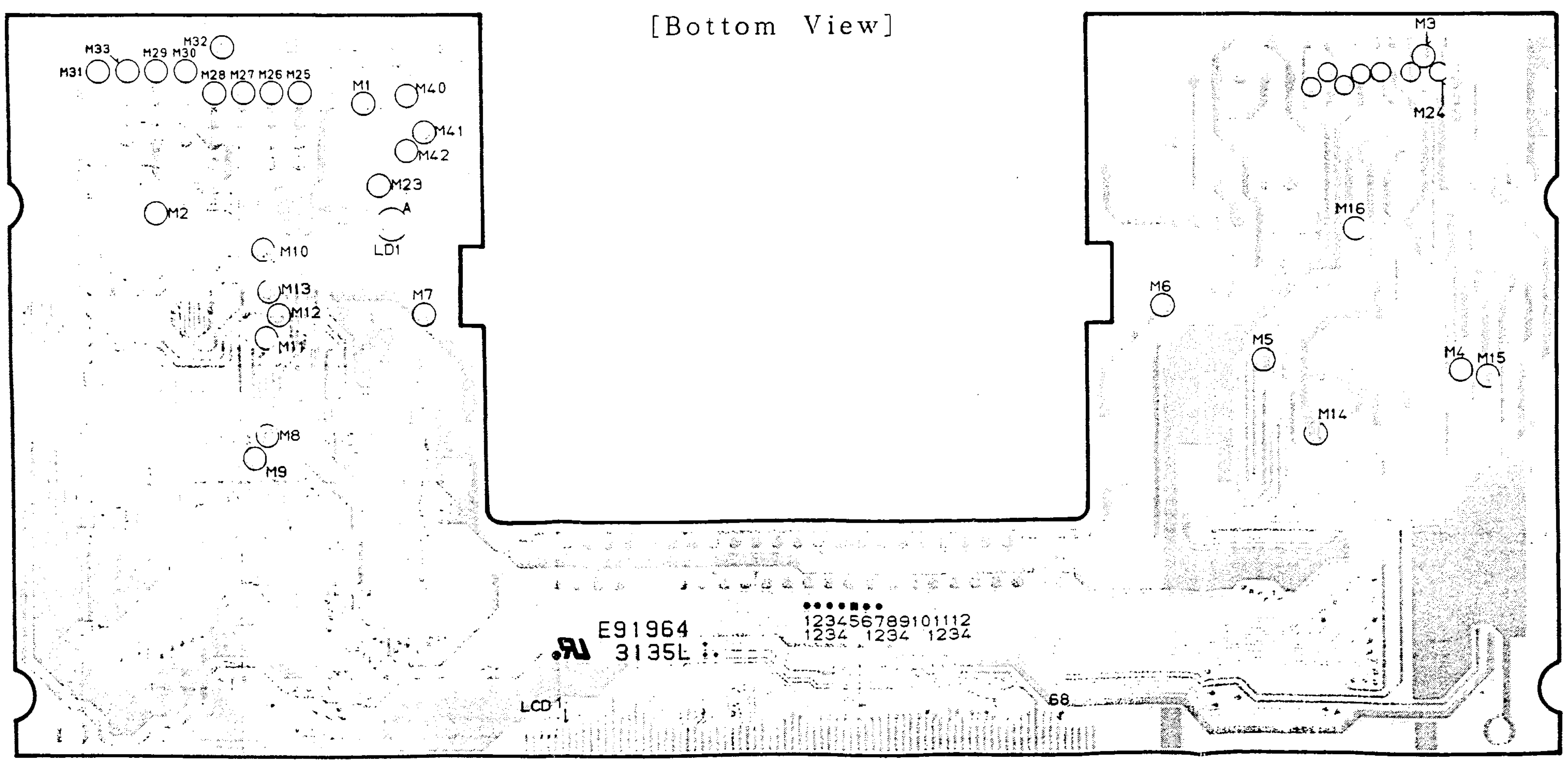


6-4. Main Circuit Board (AC230V/240V area)

[Top View]

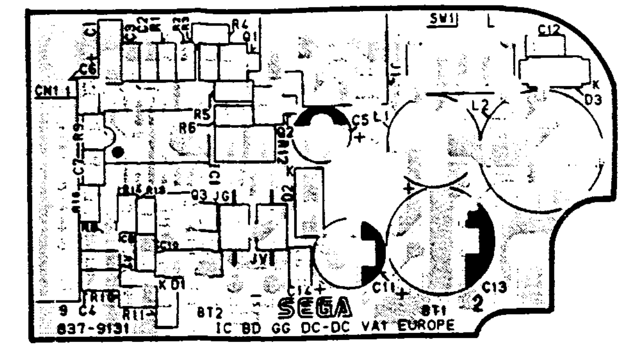


[Bottom View]

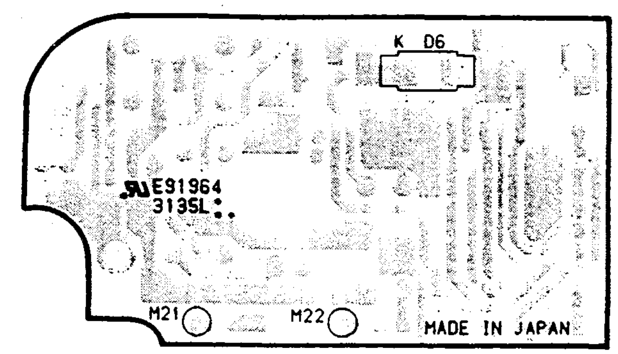


6-5. DC-DC Converter Circuit Board (AC230V/240V area)

[Top View]

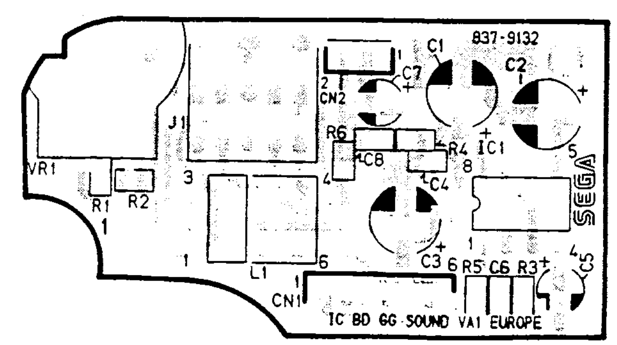


[Bottom View]

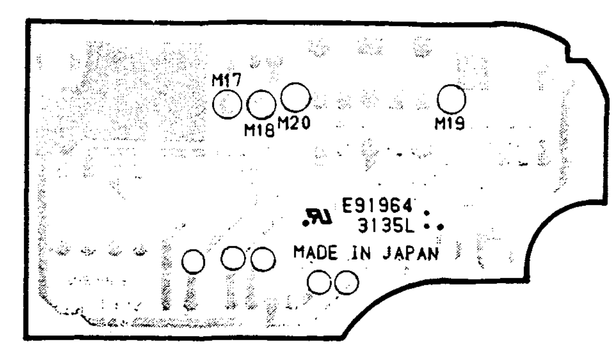


6-6. Sound Circuit Board (AC230V/240V area)

[Top View]



[Bottom View]



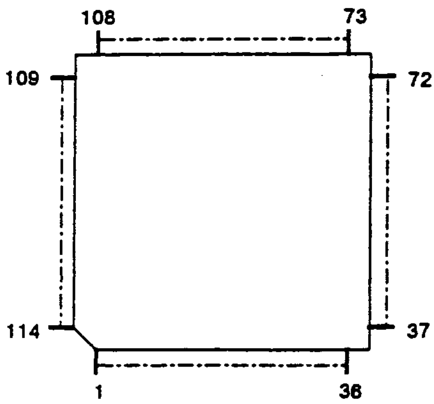
7. PARTS SPECIFICATIONS

7-1. Main Circuit Board

IC1 Custom Chip

GG QFP 144P

■ Top View



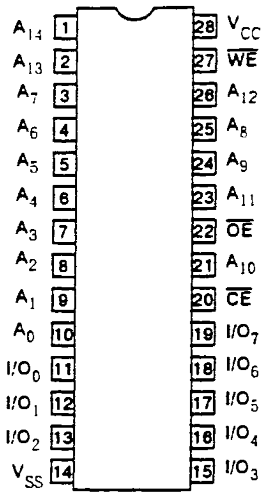
■ Description

No.	Pin Name	No.	Pin Name	No.	Pin Name	No.	Pin Name
1	V_{DD}	37	GND	73	V_{DD}	109	GND
2	A0	38	NGG	74	AD10	110	CSYN
3	A1	39	NTV	75	AD11	111	NUP
4	A2	40	NLCD	76	AD12	112	NDW
5	A3	41	A	77	AD13	113	NLE
6	A4	42	TPR2	78	AD14	114	NRI
7	A5	43	TPR1	79	NWE	115	TST2
8	A6	44	CLA3	80	NOE	116	TST1
9	A7	45	CB3	81	NCE	117	TST0
10	A8	46	CA2	82	GND (A)	118	NTSC
11	A9	47	CB2	83	VONF	119	SEC
12	A10	48	CA1	84	VRES	120	PC6
13	A11	49	CB1	85	VREF	121	PC5
14	A12	50	DW	86	SNDR	122	PC4
15	A13	51	D03	87	SNDL	123	PC3
16	A14	52	D01	88	SND1	124	PC2
17	A15	53	D04	89	SND2	125	PC1
18	GND	54	D02	90	SND3	126	PC0
19	D0	55	CL2	91	SNDN	127	CRAM
20	D1	56	P1	92	V_{DD} (A)	128	IRQ
21	D2	57	P4	93	GND (A)	129	NWR
22	D3	58	P2	94	SD10	130	NRD
23	D4	59	P3	95	SD20	131	RST
24	D5	60	DB	96	SD30	132	488
25	D6	61	AD0	97	SD40	133	HBK
26	D7	62	AD1	98	V_{DD} (A)	134	VBK
27	MRQ	63	AD2	99	SAMP	135	CP0
28	EXM1	64	AD3	100	SPON	136	V_{DD}
29	EXM2	65	AD4	101	HSYN	137	XTL2
30	VCK	66	AD5	102	VSYN	138	XTL1
31	CCK	67	AD6	103	INT	139	GND
32	NPS	68	AD7	104	NM1	140	NLED
33	NTR	69	AD8	105	WAIT	141	RSH
34	NTL	70	AD9	106	NBRQ	142	NJAP
35	NMI	71	GND	107	NBAK	143	GND
36	V_{DD}	72	GND	108	V_{DD}	144	GND

IC2

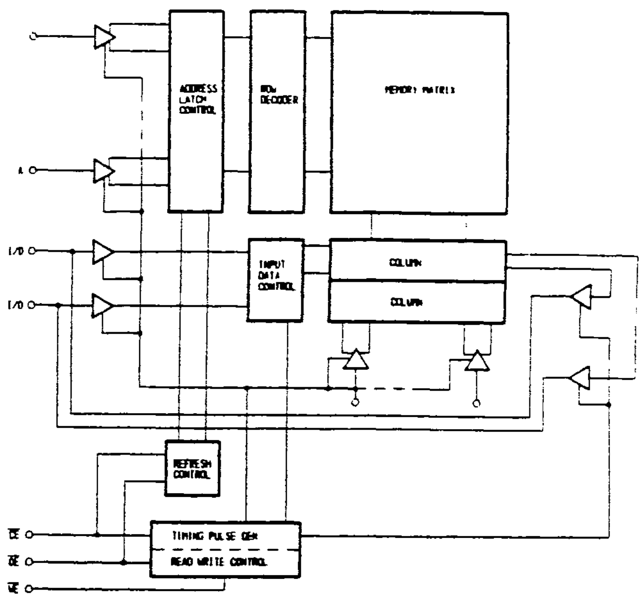
IC HM65256BLFP-12

■ Top View & Pin Layout



I/O_0-I/O_7	: Data in/outputs
$\overline{CE}$	: Chip enable input
$\overline{OE}$	: Output enable input
$\overline{WE}$	: Write enable input
Vcc	: +5V
GND	: 0V

■ Block Diagram



■ Operation Mode

$\overline{CE}$	$\overline{OE}$	$\overline{WE}$	I/O	Mode
L	L	H	Low Z	Read
L	×	L	High Z	Write
L	H	H	High Z	–
H	L	×	High Z	Refresh
H	H	×	High Z	Standby

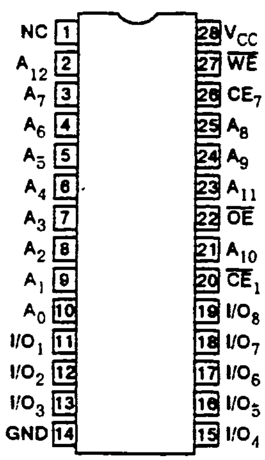
IC3

IC μ PD4364G-15L

IC MB8464A-10LL

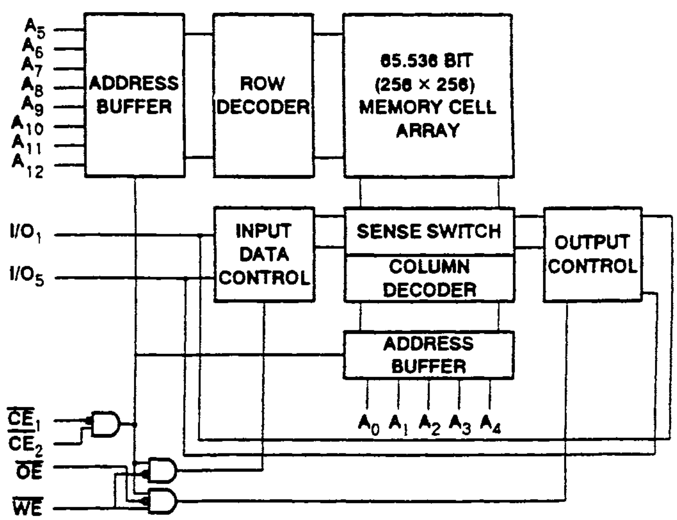
IC FCB61C65L-70T

■ Top View & Pin Layout



A_0-A_{12}	: Address inputs
$\overline{OE}$	: Output enable input
I/O_1-I/O_8	: Data in/outputs
Vcc	: +5V power supply
$\overline{CE}_1$, CE_2	: Chip enable 1, 2 inputs
GND	: Ground
$\overline{WE}$	: Write enable input
NC	: No connection

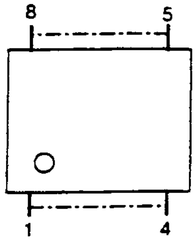
■ Block Diagram



IC4 Dual Operational Amplifier

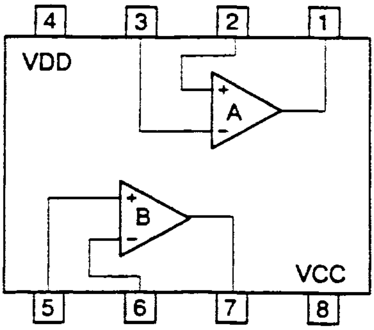
IC μ PC358G2

■ Top View



IC NJM2904-01

■ Pin Layout

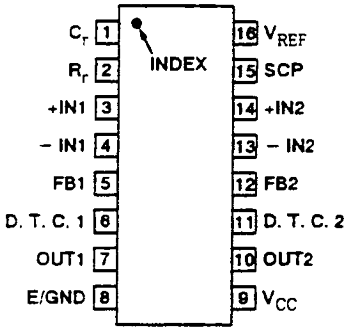


7-2 DC-DC Converter Circuit Board

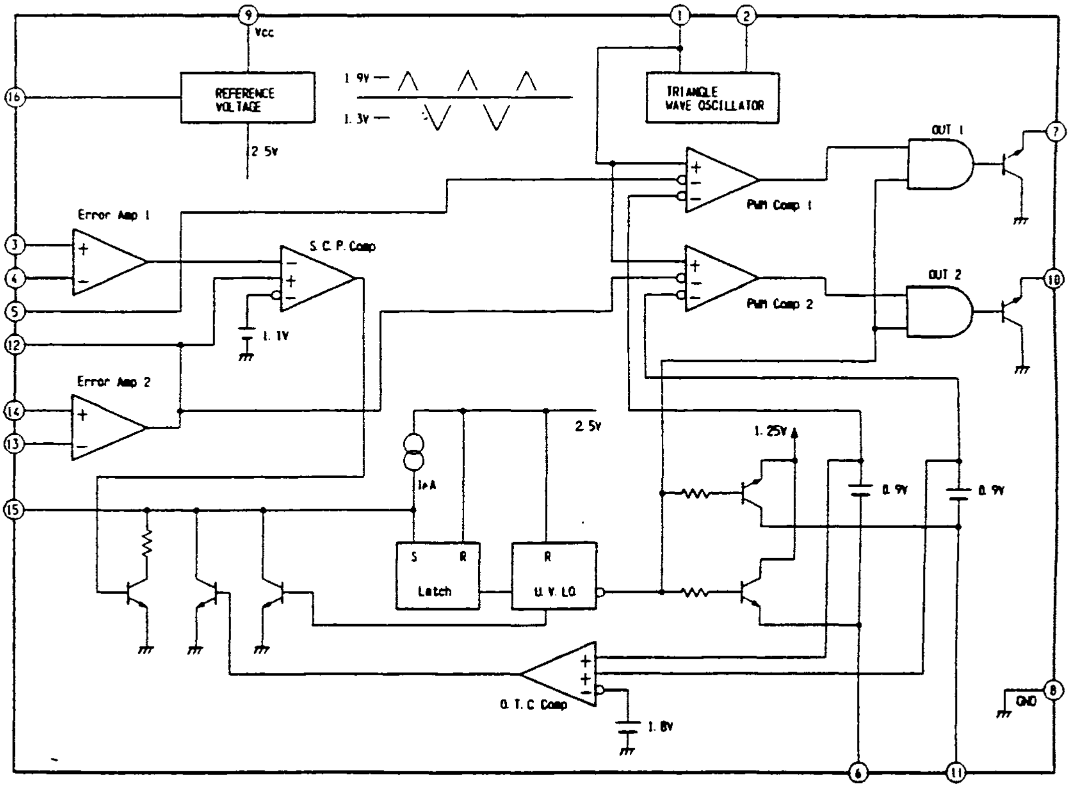
IC1

IC MB3775PF-G-BND

■ Top View & Pin Layout



■ Block Diagram

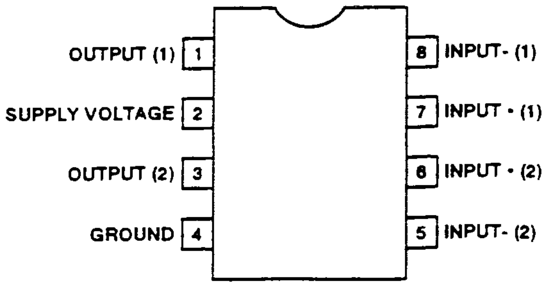


7-3 Sound Circuit Board

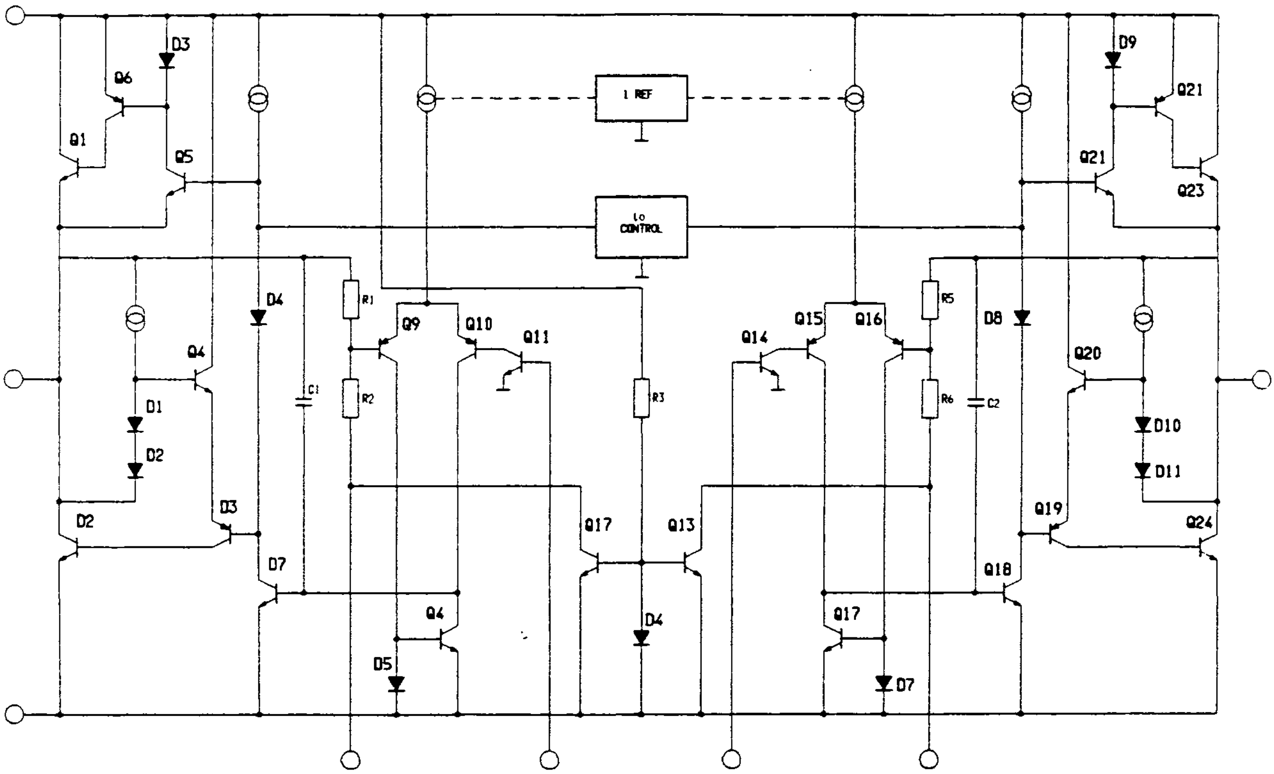
IC1

IC TDA2822M

■ Top View & Pin Layout



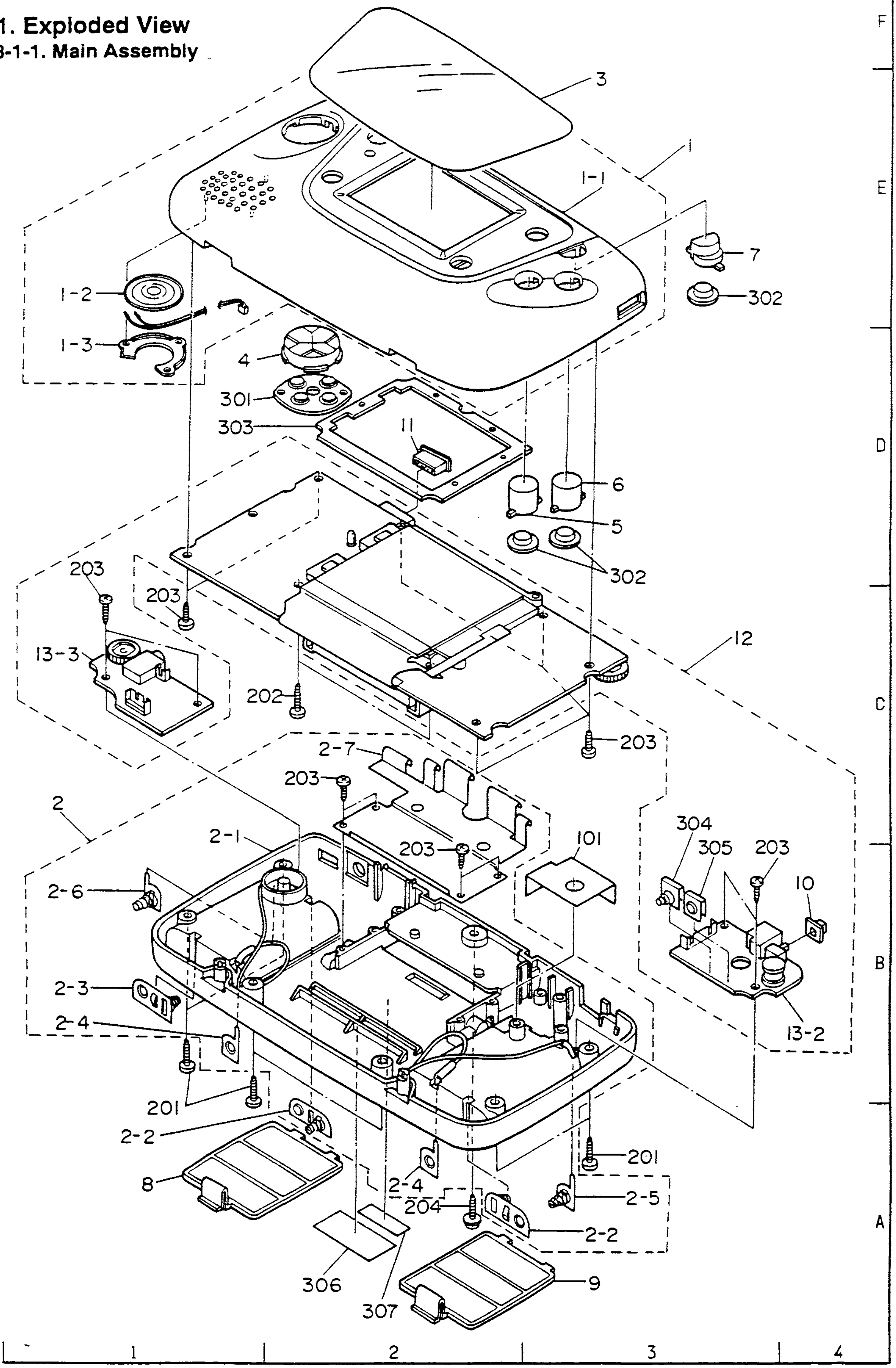
■ Block Diagram



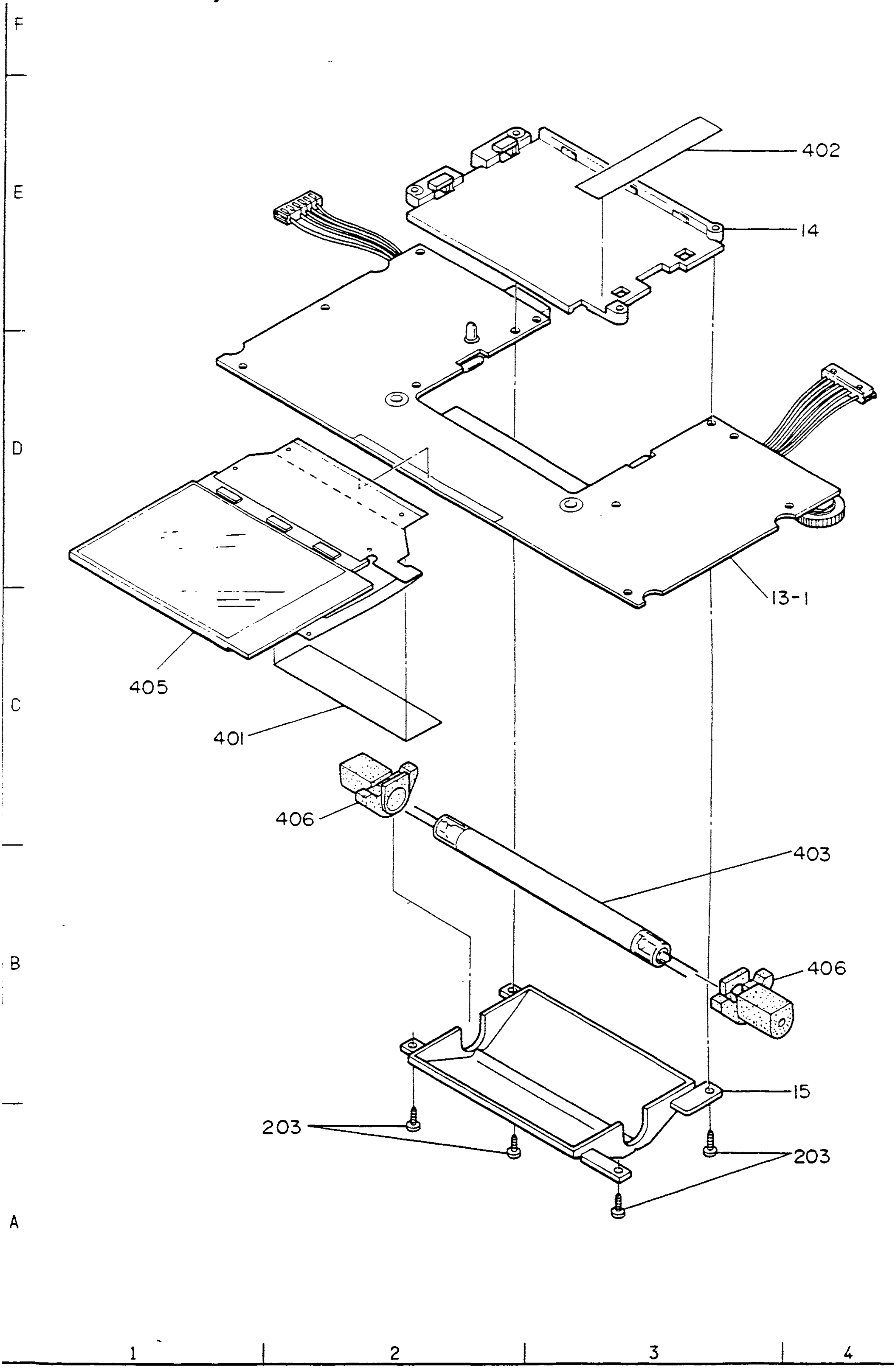
8. EXPLODED VIEW & PARTS LIST

8-1. Exploded View

8-1-1. Main Assembly



8-1-2. Sub Assembly



8-2. Mechanical Parts List

8-2-1. Main Assembly

Ref No.	Parts No.	Description	
1	610-5403	ASSY TOP CASE GG USA ALL	[A. C]
1	610-5403-01	ASSY TOP CASE GG USA ALL 01	[C. S. C]
1-1	253-6420-91	TOP CASE GG EXPORT ALL	[A. C]
1-1	253-6420-01-91	TOP CASE GG EXPORT 01 ALL	[C. S. C]
1-2	130-5052	SPKR 8 OHM 0.15W 28CS028003-01	
1-3	253-6367	SPEAKER HOLDER GG	
2	610-5213	ASSY BOTTOM CASE GG USA	[A. C]
2	610-5213-01	ASSY BOTTOM CASE GG USA 01	[C. S. C]
2-1	253-6421	BOTTOM CASE GG EXPORT	[A. C]
2-1	253-6421-01	BOTTOM CASE GG EXPORT 01	[C. S. C]
2-2	250-5208	BATT. BLADE 2P A	
2-3	250-5209	BATT. BLADE 2P B	
2-4	250-5210	BATT. BLADE 1P C	
2-5	250-5211	BATT. BLADE 1P D	
2-6	250-5214	BATT. BLADE 1P E	
2-7	250-5243	SUPPORT PLATE GG 01	
3	253-6434	CLEAR PLATE GG INMOLD	
4	253-6363-03	PAD GG 03 (CONTACT TYPE)	[2XX]
4	253-6486	PAD GG BALL TYPE	[1XX]
5	253-6364	BUTTON 1 GG	
6	253-6365	BUTTON 2 GG	
7	253-6366	START BUTTON GG	
8	253-6368	BATT LID LEFT GG	
9	253-6369	BATT LID RIGHT GG	
10	253-6378	POWER KNOB GG	
11	253-6401	10P CONN COVER GG	
12	837-7841-01P	ASSY IC BD GG USA W/SEQ	[1XX]
12	837-7994	ASSY IC BD GG EUROPE W/SEQ	[2XX]
13	837-9023	IC BD GG USA VA1 W/SEQ(CBA)	[1XX]
13	837-9023-01P	IC BD GG USA VA1 W/SEQ(CBA)	[1XX]
13	837-9129-01P	IC BD GG EUR VA1 W/SEQ(CBA)	[2XX]

Circuit No.	Parts No.	Description	
13-1	837-9024	IC BD GG MAIN USA VA1(CBA)	[1XX]
13-1	837-9024-01P	IC BD GG MAIN USA VA1 W/SEQ(CBA)	[1XX]
13-1	837-9130-01P	IC BD GG MAIN EUR VA1 W/SEQ(CBA)	[2XX]
13-2	837-9025	IC BD GG DC-DC CONV. USA VA1(CBA)	[1XX]
13-2	837-9025-01P	IC BD GG DC-DC USA VA1 W/SEQ(CBA)	[1XX]
13-2	837-9131-01P	IC BD GG DC-DC CONV. EUROPE VA1(CBA)	[2XX]
13-3	837-9026	IC BD GG SOUND USA VA1(CBA)	[1XX]
13-3	837-9026-01P	IC BD GG SOUND USA VA1 W/SEQ(CBA)	[1XX]
13-3	837-9132-01P	IC BD GG SOUND EUROPE VA1(CBA)	[2XX]
101	253-6422	BATT. BLADE COVER GG	
201	012-P02610-0B	TAP SCR PH BLK 2.6×10	
202	012-P00312	TAP SCR PH 3×12	
203	012-P00206	TAP SCR PH 2×6	
204	029-000003-0B	TAP SCR LH-3 2.6×10 BLK	
301	509-5334	RUBBER CONTACT GG 4P	[2XX]
301	509-5435	RUBBER CONTACT GG 4P BALL TYPE	[1XX]
302	509-5335	RUBBER CONTACT GG 1P	
303	601-6428	LCD CUSHION GG	
304	250-5202	BATT. BLADE 1P B	
305	250-5203	BATT. BLADE 1P A	
306	670-2704	LABEL INDICATION GG USA SMITH	[1XX]
306	670-2707	LABEL INDICATION GG MUL SMITH	[2XX]
307	670-2705	LABEL SER. NO. GG	

【NOTE】
1. The insides of the top and bottom cases are coated with aluminum or given a conductive surface treatment. Combine the top and bottom cases with the same coating. A top case coated with aluminum and a bottom case with a conductive surface treatment or vice versa cannot be used in combination.
2. [1XX]→ AC120V area. [2XX]→ AC230V/240V area.
3. The MAIN, DC-DC conv. and SOUND boards cannot be ordered individually.

8-2-2. Sub Assembly

Ref No.	Parts No.	Description
14	253-6370	SPREAD PLATE GG
15	253-6380	REFLECT COVER GG
203	012-P00206	TAP SCR PH 2×6
401	090-0050	POLY FILM 633S
402	090-0048	TAPE GG
403	390-5309	FL LIGHT GG (BACK LIGHT) ELEBAM
405	390-5311	ASSY LCD 3.2" COLOR GG CITIZEN
406	601-6541	FL LIGHT PROTECTOR GG

【NOTE】
Please place order of POLY FILM in units of rolls.
One roll of POLY FILM can be used for approx. 300 Game Gear units.

Circuit No.	Parts No.	Description

al Parts List

Circuit Board

Circuit No.	Parts No.	Description	
	)	IC CUSTOM CHIP GG QFP 144P	NEC
	7-A	IC HM65256BLFP-12 SOP 28P	HITACHI
	6-A	IC UPD4364G-15L SOP 28P	NEC
	5-A	IC KM6264BLG-12 SOP 28P	SAMSONG
	1-A	IC FCB61C65L-70T SOP 28P	PHILIPS
	35-A	IC MB8464A-10LL SOP	FUJITSU
	53-10A	IC LC3564PM-10L SOP	SANYO
	53-12A	IC LC3564PM-12L SOP	SANYO
	66-10A	IC LC3664BML-10H SOP	SANYO
	66-85A	IC LC3664BML-85H SOP	SANYO
	330-10A	IC MB8464H-10LL SOP 28P	FUJITSU
	331-15A	IC GM76C88ALFW-15 SOP 28P	KINSEI
	134-A	IC UPC358G2 SOP 8P	NEC
	134-01-A	IC NJM2904-01 SOP 8P	JRC
	5127	XSTR 2SD1614 CHIP	NEC
	5127	XSTR 2SD1614 CHIP	NEC
	5126	XSTR 2SC1623 L5..7 CHIP	NEC
	-5126	XSTR 2SC1623 L5..7 CHIP	NEC
	-5126	XSTR 2SC1623 L5..7 CHIP	NEC
	-5125	XSTR 2SA812 M5..7 CHIP	NEC
	-5126	XSTR 2SC1623 L5..7 CHIP	NEC
	-5125	XSTR 2SA812 M5..7 CHIP	NEC
	-5126	XSTR 2SC1623 L5..7 CHIP	NEC
	T USED	NOT USED	
	0-5308	LED SLR 34-VT3F	ROHM
	31-5072	DIODE 1SS184 CHIP	TOSHIBA
	81-5072	DIODE 1SS184 CHIP	TOSHIBA
	81-5072	DIODE 1SS184 CHIP	TOSHIBA
	81-5072	DIODE 1SS184 CHIP	TOSHIBA
	230-5066	XTAL OSC 32.215905M 100PPM	TQC
	209-5037-01A	CONN 45P FOR GG 3HOLES	AMP
	209-5037-02A	CONN 45P FOR GG 3HOLES	FUJITSU
	209-5038	CONN 10P FOR GG HDC-0492	HOSHIDEN
	600-5910	WIRE HARN 6P FOR GG 60MM	HIRAKAWA
	600-5911	WIRE HARN 9P FOR GG 60MM	HIRAKAWA
	514-5040	FUSE THERMAL SM095B0	NEC
	514-5040	FUSE THERMAL SM095B0	NEC
	079-000003	EYLET 3.5×7	
	079-000003	EYLET 3.5×7	
	271-0007	EMI FILTER STX222MB	TAIYO
	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
	271-0007-04	EMI FILTER ED31-B222M	TOKIN
	271-0007	EMI FILTER STX222MB	TAIYO
	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
	271-0007-04	EMI FILTER ED31-B222M	TOKIN
	271-0007	EMI FILTER STX222MB	TAIYO
3	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
3	271-0007-04	EMI FILTER ED31-B222M	TOKIN
4	271-0007	EMI FILTER STX222MB	TAIYO
4	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
M4	271-0007-04	EMI FILTER ED31-B222M	TOKIN
M5	271-0007	EMI FILTER STX222MB	TAIYO
M5	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
M5	271-0007-04	EMI FILTER ED31-B222M	TOKIN
EM6	271-0007	EMI FILTER STX222MB	TAIYO
EM6	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
EM6	271-0007-04	EMI FILTER ED31-B222M	TOKIN
EM7	271-0007	EMI FILTER STX222MB	TAIYO
EM7	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
EM7	271-0007-04	EMI FILTER ED31-B222M	TOKIN
EM8	271-0007	EMI FILTER STX222MB	TAIYO

Circuit No.	Parts No.	Description	
EM8	271-0007-02	EMI FILTER DSS306-93E222Z100	MURATA
EM8	271-0007-04	EMI FILTER ED31-B222M	TOKIN
L1	271-0017	BEADS INDUCTOR FBA04VA900AB-00	TAIYO
L1	271-0017-02	BEADS INDUCTOR HF70BTL3.5×9R	TDK
L2	180-5077	CHOKE COIL 105UH KI-1589	KIJIMA
L2	180-5092	CHOKE COIL 105UH	TOKYO TRANS
L2	180-5114	CHOKE COIL 105UH CA-C-D007-001	FUJI
L3	180-5073	P.COIL CHIP 100UH LEM4532T101K	TAIYO
L3	180-5073-02	P.COIL CHIP 100UH NL453232T-101K	TDK
T1	560-5172	INVERTER XFMR KI-1588	KIJIMA
T1	560-5201	INVERTER XFMR TT911217-1	TOKYO TRANS
T1	560-5251	INVERTER XFMR CA-T-1618-001	FUJI
VR1	220-5339	VOL CONT 20K B RK09J11T0	ALPS
VR1	220-5339-01	VOL CONT 20K B-TYPE	HOKURIKU
R1	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%	
R2	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%	
R3	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%	
R4	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%	
R5	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%	
R6	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%	
R7	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%	
R8	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%	
R9	476-2471-J-10	RES CHIP 470 OHM 1/10W 5%	
R10	476-2472-J-10	RES CHIP 4.7K OHM 1/10W 5%	
R11	476-2472-J-10	RES CHIP 4.7K OHM 1/10W 5%	
R12	476-1122-J-16	RES CHIP 1.2K OHM 1/16W 5%	
R13	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R14	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R15	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R16	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R17	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R18	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R19	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R20	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R21	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R22	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%	
R23	476-2472-J-10	RES CHIP 4.7K OHM 1/10W 5%	
R24	476-2182-J-10	RES CHIP 1.8K OHM 1/10W 5%	
R25	476-2510-J-10	RES CHIP 51 OHM 1/10W 5%	
R26	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%	
R27	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%	
R28	476-2912-F-10	RES CHIP 9.1K OHM 1/10W 1%	
R29	476-2112-F-10	RES CHIP 1.1K OHM 1/10W 1%	
R30	476-2302-F-10	RES CHIP 3K OHM 1/10W 1%	
R31	476-2104-J-10	RES CHIP 100K OHM 1/10W 5%	
R32	476-2104-J-10	RES CHIP 100K OHM 1/10W 5%	
R33	476-2303-J-10	RES CHIP 30K OHM 1/10W 5%	
R34	476-2203-J-10	RES CHIP 20K OHM 1/10W 5%	
R35	476-2510-J-10	RES CHIP 51 OHM 1/10W 5%	
R36	476-2563-F-10	RES CHIP 56K OHM 1/10W 1%	
R37	476-2303-F-10	RES CHIP 30K OHM 1/10W 1%	
R38	476-2510-J-10	RES CHIP 51 OHM 1/10W 5%	
R39	476-2471-F-10	RES CHIP 470 OHM 1/10W 1%	
R40	476-2471-F-10	RES CHIP 470 OHM 1/10W 1%	
R41	476-2222-J-10	RES CHIP 2.2K OHM 1/10W 5%	
R42	476-2244-J-10	RES CHIP 240K OHM 1/10W 5%	
R43	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%	
R44	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%	
R45	476-2105-J-10	RES CHIP 1M OHM 1/10W 5%	
R46	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%	
R47	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%	
R48	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%	
R49	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%	
R50	476-2473-J-10	RES CHIP 47K OHM 1/10W 5%	
R51	476-2473-J-10	RES CHIP 47K OHM 1/10W 5%	
R52	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%	
R53	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%	
R54	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%	
R55	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%	

1 Use the Circuit No. L2 and T1 of the same manufacturer. (KIJIMA or TOKYO TRANS)

[2XX]→ AC230V/240V area.

Circuit No.	Parts No.	Description
R56	476-2182-J-10	RES CHIP 1.8K OHM 1/10W 5%
R57	476-2182-J-10	RES CHIP 1.8K OHM 1/10W 5%
R58	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
J1	NOT USED	NOT USED (W/SEQ)
C1	150-0311	CAP E CHIP 33UF 6.3V MF6.3FC33D8
C2	NOT USED	NOT USED
C3	NOT USED	NOT USED
C4	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6
C4	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MCZ2GH
C5	NOT USED	NOT USED
C6	151-0320	CAP CER CP 68PF 50V J CH 2125
C7	151-0358	CAP CER CP 0.33UF 16V ZF 2125
C8	151-0358	CAP CER CP 0.33UF 16V ZF 2125
C9	151-0358	CAP CER CP 0.33UF 16V ZF 2125
C10	151-0358	CAP CER CP 0.33UF 16V ZF 2125
C11	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6
C11	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MCZ2GH
C12	151-0307	CAP CER CP 0.022UF 50V ZF 2125
C13	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C14	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6
C14	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MCZ2GH
C15	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C16	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C17	151-0357	CAP CER CP 1200PF 50V K B 1608
C18	151-0291	CAP CER CP 39PF 50V K SL 1608
C19	151-0291	CAP CER CP 39PF 50V K SL 1608
C20	151-0291	CAP CER CP 39PF 50V K SL 1608
C21	151-0291	CAP CER CP 39PF 50V K SL 1608
C22	151-0291	CAP CER CP 39PF 50V K SL 1608
C23	151-0291	CAP CER CP 39PF 50V K SL 1608
C24	151-0291	CAP CER CP 39PF 50V K SL 1608
C25	151-0291	CAP CER CP 39PF 50V K SL 1608
C26	151-0291	CAP CER CP 39PF 50V K SL 1608
C27	151-0291	CAP CER CP 39PF 50V K SL 1608
C28	151-0291	CAP CER CP 39PF 50V K SL 1608
C29	151-0291	CAP CER CP 39PF 50V K SL 1608
C30	151-0291	CAP CER CP 39PF 50V K SL 1608
C31	151-0291	CAP CER CP 39PF 50V K SL 1608
C32	151-0263	CAP CER CP 2200PF 50V KB 2125
C33	151-0263	CAP CER CP 2200PF 50V KB 2125
C34	151-0263	CAP CER CP 2200PF 50V KB 2125
C35	151-0263	CAP CER CP 2200PF 50V KB 2125
C36	151-0263	CAP CER CP 2200PF 50V KB 2125
C37	151-0263	CAP CER CP 2200PF 50V KB 2125
C38	151-0263	CAP CER CP 2200PF 50V KB 2125
C39	151-0328	CAP CER CHIP 22PF 50V CH 2125
C40	151-0328	CAP CER CHIP 22PF 50V CH 2125
C41	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C42	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6
C42	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MCZ2GH
C43	151-0309	CAP E CHIP 22UF 6.3V MF6.3FC22D6
C44	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C45	150-0307	CAP E CHIP 4.7UF 35V MF35FC4.7D6
C46	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C47	150-0318	CAP E CHIP 68UF 6.3V MF6.3FC68D10
C48	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C49	150-0319	CAP E CHIP 100UF 4V MF4FC100D10
C50	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C51	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C52	151-0271	CAP CER CP 0.01UF 50V ZF 2125
C53	151-0271	CAP CER CP 0.01UF 50V ZF 2125
C54	150-0317	CAP E CHIP 0.47UF 50V MF50VFC0.47A6
C55	150-0317	CAP E CHIP 0.47UF 50V MF50VFC0.47A6
C56	151-0270	CAP CER CP 47PF 50V KSL 2125
C57	151-0270	CAP CER CP 47PF 50V KSL 2125
C58	151-0286	CAP CER CHIP 0.47UF 16V ZF GSR 40
C59	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C60	151-0286	CAP CER CHIP 0.47UF 16V Z F GSR40
C61	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C61	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C61	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C62	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C62	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C62	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C63	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C64	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C64	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C64	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C65	151-0264	CAP CER CP 8200PF 50V KB 2125
C66	151-0264	CAP CER CP 8200PF 50V KB 2125
C67	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C67	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C67	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C68	150-0313	CAP E CHIP 100UF 6.3V MF6.3FC100D13
C69	152-0177	CAP MP 0.1UF 100V 10%
C70	151-0272	CAP CER 270PF 2KV SL MURATA
C70	151-0272-01	CAP CER 270PF 2KV SL MURAYAMA
C71	151-0307	CAP CER CP 0.022UF 50V ZF 2125
C72	151-0307	CAP CER CP 0.022UF 50V ZF 2125
C73	151-0307	CAP CER CP 0.022UF 50V ZF 2125

8-3-2. DC-DC Converter Circuit Board

Circuit No.	Parts No.	Description
IC1	313-5140-A	IC MB3775PF-G-BND SOP FUJITSU
Q1	482-5125	XSTR 2SA812 M5..7 CHIP NEC
Q2	482-5126	XSTR 2SC1623 L5..7 CHIP NEC
Q3	482-5130	XSTR CHIP 2SB1301 ZQ OR ZP NEC
D1	481-5111	DIODE CHIP U1BC44 TOSHIBA
D2	481-5071	DIODE CHIP HRF 22 HITACHI
D3	481-5071	DIODE CHIP HRF 22 HITACHI
D6	NOT USED	NOT USED
J1	210-5078	CONN DC JACK EIAJ W/SW HOSHIDEN[1XX]
J1	210-5062	CONN DC JACK W/SW LGP4013-0300 [2XX]
CN1	212-5355	CONN 9P FOR GG 178094-9 AMP
SW1	510-5028	SLIDE SW HSW1805-010010 HOSHIDEN
L1	180-5071	CHOKE COIL 1.2MH FL7H122J TAIYO
L2	180-5072	CHOKE COIL 68UH TSL1110680K1R TDK
L2	180-5083	CHOKE COIL 68UH A90-870-0 SEIBU
JV	271-0041	BEADS INDUCTOR FBA04VA450AB-00 TAIYO
JV	271-0041-01	BEADS INDUCTOR B-01C-AT
JG	271-0041	BEADS INDUCTOR FBA04VA450AB-00 TAIYO
JG	271-0041-01	BEADS INDUCTOR B-01C-AT
R1	476-2333-J-10	RES CHIP 33K OHM 1/10W 5%
R2	476-2273-J-10	RES CHIP 27K OHM 1/10W 5%
R3	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
R4	476-2392-J-10	RES CHIP 3.9K OHM 1/10W 5%
R5	476-2222-J-10	RES CHIP 2.2K OHM 1/10W 5%
R6	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
R7	476-2114-F-10	RES CHIP 110K OHM 1/10W 1%
R8	476-2432-F-10	RES CHIP 4.3K OHM 1/10W 1%
R9	476-2473-J-10	RES CHIP 47K OHM 1/10W 5%
R10	476-2333-J-10	RES CHIP 33K OHM 1/10W 5%
R11	476-2123-J-10	RES CHIP 12K OHM 1/10W 5%
R12	476-0361-J-04	RES CHIP 360 OHM 1/4W 5%
R13	476-2221-J-10	RES CHIP 220 OHM 1/10W 5%

【NOTE】 1. [1XX]→ AC120V area. [2XX]→ AC230V/240V area.

Circuit No.	Parts No.	Description
R14	476-2203-F-10	RES CHIP 20K OHM 1/10W 1%
R15	476-2682-F-10	RES CHIP 6.8K OHM 1/10W 1%
C1	153-0088	CAP TANT CP 0.68UF 16V 3216
C1	153-0096	CAP TANT CHIP 0.68UF 20V 20% F9
C2	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C3	151-0269	CAP CER CP 0.1UF 25V K 2125
C4	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C5	150-0314-A	CAP E 22UF 35V M 35SP(X)22
C5	150-0314-01A	CAP E 22UF 35V 35YXB22MY0511
C6	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C7	151-0268	CAP CER CHIP 680PF K B 2125
C8	151-0269	CAP CER CP 0.1UF 25V K 2125
C10	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C11	150-0315-A	CAP E 100UF 25V M 25SP(X)100
C11	150-0315-01A	CAP E 100UF 25V 25YXB100MY0611
C12	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C13	150-0316-A	CAP E 820UF 6.3V M 6.3SP(X)820
C13	150-0316-01A	CAP E 820UF 6.3V 6.3YXB820Y
C14	151-0265	CAP CER CP 0.1UF 25V ZF 2125

8-3-3. Sound Circuit Board

Circuit No.	Parts No.	Description
IC1	313-5141	IC TDA2822M SGS
IC1	313-5141-01	IC KA2209 8P DIP SAMSUNG
J1	210-5061	CONN MINI JACK HSJ0873-01-440 HOSHIDEN
CN1	212-5354	CONN 6P FOR GG 188094-6 AMP
CN2	212-5356-02	CONN M MT AMP CT 2P 173981-2 AMP
VR1	220-5343	SW VOL CONT 10K OHM K102J0Z25 ALPS
VR1	220-5343-01	VOL CONT 10K OHM A-TYPE HOKURIKU
R1	476-2563-J-10	RES CHIP 56K OHM 1/10W 5%
R2	476-2563-J-10	RES CHIP 56K OHM 1/10W 5%
R3	476-24R7-J-10	RES CHIP 4.7 OHM 1/10W 5%
R4	476-24R7-J-10	RES CHIP 4.7 OHM 1/10W 5%
R5	476-2101-J-10	RES CHIP 100 OHM 1/10W 5%
R6	476-2101-J-10	RES CHIP 100 OHM 1/10W 5%
C1	150-0313-01	CAP E CP 100UF 6.3V MV6.3VC100
C1	150-0313-03	CAP E CHIP 100UF 6.3V 20% UWX0
C2	150-0313-01	CAP E CP 100UF 6.3V MV6.3VC100
C2	150-0313-03	CAP E CHIP 100UF 6.3V 20% UWX0
C3	150-0313-01	CAP E CP 100UF 6.3V MV6.3VC100
C3	150-0313-03	CAP E CHIP 100UF 6.3V 20% UWX0
C4	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C5	150-0312-01	CAP E CP 47UF 4V MV4VC47
C5	150-0312-02	CAP E CHIP 47UF 4V UWX0G470MCR
C6	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C7	150-0312-01	CAP E CP 47UF 4V MV4VC47
C7	150-0312-02	CAP E CHIP 47UF 4V UWX0G470MCR
C8	151-0265	CAP CER CP 0.1UF 25V ZF 2125
LF1	270-5044-02	LINE FILTER SDP-103C1 TOKIN
LF1	270-5057	LINE FILTER CM04RC02T TAIYO

【NOTE】 1. [1XX]→ AC120V area. [2XX]→ AC230V/240V area.

8-4. Accessories/Package List

No.	Parts No.	Description
1	400-5050	AC ADAPTOR AC240V/DC9V 1A AS(AUSTRALIA)
1	400-5109A	AC ADAP. AC240V/DC9V 0.85A BS (U.K, KUWAIT)
1	400-5204	AC ADAPTOR AC220V/DC 10V 0.85A (EXCEPT U.K, KUWAIT, USA&CANADA)
2	601-6499	STRAP GG
3	610-5343	PACKING GG PLUS TRAY & LID(MK-2182 (AUSTRALIA, KUWAIT, SAUDIARABIA & SPAIN))
3	610-5365	PACKING TRAY GG EXPORT SET (MK-2180(SPAIN))
4	670-0332-01	SEAL G.PREZIOSI ITALY 01 (MK-2100/2182/2184(ITALY))
5	670-0364-27	BAR CODE SEAL MULTI(2180) (MK-2180(SPAIN))
6	670-0863-02	MEMBERSHIP CARD SWEDEN 02(SWEDEN)
7	670-1440	STICKER GG USA (MK-2100(USA))
7	670-2582	STICKER INCL. COLUMNS GG ITALY (MK-2100(ITALY))
8	670-1523	INFOR SHEET GG CANADA(MK-2100(CANADA))
9	670-1564-04	BUSINESS REPLY MAIL GG USA 04(USA)
9	670-4106	BUSINESS REPLY CARD SOC(MK-2122/2131 (CANADA))
10	670-1513	WARRANTY CARD GG CANADA (MK-2100(CANADA))
10	670-1629-01	WARRANTY CARD GG ITA 01(ITALY)
10	670-2401	GUARANTEE CARD SOE GG ESP(SPAIN)
10	670-2757-02	GUARANTEE CARD GG SOE 02(SEGA OF EUROPE)
10	670-3327	WARRANTY CARD OZISOFT AUS(AUSTRALIA)
11	670-2778	EPILEPSY WARNING SHEET USA(USA)
11	670-2779	EPILEPSY WARNING SHEET MULTI (MK-2100(CANADA))
12	670-2116-**	GAME CATALOG GG USA (MK-2122/2131(CANADA))
13	670-4206	PERIPHERAL CATALOG GG USA (MK-2122/2131(USA & CANADA))
14	671-1270-02	BOX GG MULTI CE SMITH 02 (MK-2180(SPAIN))
14	671-1892-02	BOX GG W/AC MULTI CE SMITH 02 (MK-2182(KUWAIT/SAUDIARABIA/SPAIN))
15	671-3757	BOX & PACK SET GG 2100 PM(MK-2100(USA))
15	671-3763	BOX & PACK SET GG 2121 PM(MK-2121(USA))
15	671-3775	BOX & PACK SET GG 2131 PM(MK-2131(USA))
15	671-4664	BOX & PACK SET GG 2122 PM(MK-2122(USA))
15	671-3785	BOX & PACK SET GG CAN 2100 PM (MK-2100(CANADA))
15	671-3790	BOX & PACK SET GG CAN 2122 PP (MK-2122(CANADA))
15	671-3797	BOX & PACK SET GG CAN 2131 PM (MK-2131(CANADA))
15	671-3856	BOX & PACK SET GG MUL 2100 PM (MK-2100(Except USA & CANADA))
15	671-3861	BOX & PACK SET GG MUL 2184 PM (MK-2184(Except USA & CANADA))
15	671-3919	BOX & PACK SET GG MUL 2182 PP (MK-2182(Except USA, CANADA, AUSTRALIA, KUWAIT, SPAIN & SAUDIARABIA)
15	671-3940	BOX & PACK SET GG MUL 2180 P (MK-2180(Except USA & CANADA))
16	671-2369E	INR-CTN GG USA 2122 E(MK-2122(USA))
16	671-3759	INR-CTN GG USA 2100 PM(MK-2100(USA))
16	671-3765	INR-CTN GG USA 2121 PM(MK-2121(USA))
16	671-3777	INR-CTN GG USA 2131 PM(MK-2131(USA))
16	671-2369-02	INR-CTN GG CAN 2122-22(MK-2122(CANADA))
16	671-3787	INR-CTN GG CAN 2100 PM(MK-2100(CANADA))
16	671-3799	INR-CTN GG CAN 2131 PM(MK-2131(CANADA))

No.	Parts No.	Description
16	671-1362	INR CTN GG MULTI(2180) (MK-2180(Except USA & CANADA))
16	671-3857	INR CTN GG MULTI 2100 PM (MK-2100(Except USA & CANADA))
16	671-3862	INR-CTN GG MULTI 2184 PM (MK-2184(Except USA & CANADA))
16	671-3941	INR-CTN GG MULTI 2180 PM (MK-2180(Except USA & CANADA))
17	671-2370E	MA CTN GG USA 2122 E(MK-2122(USA))
17	671-3760	MA CTN GG USA 2100 PM(MK-2100(USA))
17	671-3766	MA CTN GG USA 2121 PM (MK-2121(USA))
17	671-3778	MA CTN GG USA 2131 PM(MK-2131(USA))
17	671-2370-02	MA CTN GG CAN 2122-22 (MK-2122(CANADA))
17	671-3788	MA CTN GG CAN 2100 PM (MK-2100(CANADA))
17	671-3800	MA CTN GG CAN 2131 PM(MK-2131(CANADA))
17	671-1363	MA CTN GG MULTI (2180) (MK-2180(Except USA & CANADA))
17	671-1893	MA CTN GG PLUS MULTI (2182) MK-2182(Except USA & CANADA))
17	671-3858	MA CTN GG MULTI 2100 PM (MK-2100(Except USA & CANADA))
17	671-3863	MA CTN GG MULTI 2184 PM (MK-2184(Except USA & CANADA))
17	671-3942	MA CTN GG MULTI 2180 PM (MK-2180(Except USA & CANADA))
18	671-1917	PACKING CASE GG MULTI (MK-2180(SPAIN))
18	671-1918	PACKING BOARD GG MULTI (MK-2180(SPAIN))
19	672-0422-02	INSTR MANUAL GG USA 02(USA)
19	672-0422-22E	INSTR MANUAL GG CANADA E(CANADA)
19	672-0422-22F	INSTR MANUAL GG CANADA F(CANADA)
19	672-0422-51	INSTR MANUAL GG MUL EPILESY (Except USA / CANADA & SAUDIARABIA)
19	672-1041	INSTR MANUAL GG KSA(SAUDIARABIA)
20	672-0423	PLAY INSTR GG USA COLUMS (USA)
20	672-0646	PLAY INSTR GG USA SONIC H·H (USA)
20	672-0972	PLAY INSTR GG USA SONIC2 (USA)
20	672-0972-22	PLAY INSTR GG SONIC2 CAN(CANADA)
20	672-0423-50	PLAY INSTR GG COLUMNS MULTI(Except USA)
20	672-0646-50	PLAY INSTR GG SONIC H·H MUL (Except USA & CANADA)
20	672-1063-50	PLAY INSTR GG 4 IN 1 MUL (Except USA & CANADA)

【NOTE】

ACCESSORY PROVIDED

MODEL NO.	MK-2100	MK-2121	MK-2122	MK-2131
SONIC CARTRIDGE	NO	YES	NO	NO
SONIC2 CARTRIDGE	NO	NO	NO	YES
COLUMNS CARTRIDGE	YES	NO	NO	NO
4 IN 1 CARTRIDGE	NO	NO	NO	NO
AC ADAPTOR	NO	NO	NO	NO

MK-2180	MK-2182	MK-2184
NO	YES	NO
NO	NO	NO
NO	NO	NO
NO	NO	YES
NO	YES	NO

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